

WHAT IS CLAIMED IS:

1. A cationic catalysis system comprising an initiator (I), a catalyst (K) and a cocatalyst (CoK).  
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2. The catalytic system as claimed in claim 1, characterized in that the cocatalyst (CoK) is an agent which releases the polymerization active center from its counterion generated by the reaction between the catalyst (K) and the initiator (I).  
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3. The catalytic system as claimed in claim 2, characterized in that the cocatalyst (CoK) is a molecule having at least one double bond depleted in electrons by an electron-withdrawing group.  
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4. The catalytic system as claimed in claim 3, characterized in that the cocatalyst (CoK) is taken from the group of complexing agents consisting of o-chloranil (3,4,5,6-tetrachloro-1,2-benzoquinone), p-chloranil (2,3,5,6-tetrachloro-1,4-benzoquinone), nitrobenzene, trinitrobenzene, tetracyanoethylene, difluoronitrobenzene, pentafluorobenzene, hexafluorobenzene and octafluorotoluene.  
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5. The catalytic system as claimed in one of the preceding claims, characterized in that the catalyst (K) comprises an element (M) belonging to Groups IB, IIB and A, IIIB and IIIA, IVB and IVA, VB and VA, and VIIIB of the Periodic Table of the Elements.  
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6. The catalytic system as claimed in claim 5, characterized in that the element (M) is taken from the group consisting of the chemical elements

B, Ti, Sn, Al, Hf, Zn, Be, Sb, Ga, In, Zr, V, As and Bi.

7. The catalytic system as claimed in either of  
5 claims 5 and 6, characterized in that the catalyst  
(K) is a Lewis acid of general formula  $R_nMX_{3-n}$  for  
M an element belonging to Group IIIA, of general  
formula  $MX_4$  for M an element belonging to Groups  
VA, IVA and IVB, and of general formula  $MX_5$  for M  
10 an element belonging to Group VB, with:
- R a monovalent radical taken from the group  
consisting of trifluoromethylsulfonate,  
hydrocarbon groups with 1 to 12 carbon atoms  
of alkyl, aryl, arylalkyl, alkylaryl or  
15 cycloalkyl type, and alkoxys;
  - X a halogen atom taken from the group F, Cl,  
Br and I;
  - n an integer from 0 to 3.
- 20 8. The catalytic system as claimed in one of claims 5  
to 7, characterized in that the catalyst is taken  
from the group consisting of  $TiCl_4$ ,  $ZrCl_4$ ,  $SnCl_4$ ,  
 $VCl_4$ ,  $SbF_5$ ,  $AlCl_3$ ,  $AlBr_3$ ,  $BF_3$ ,  $BCl_3$ ,  $FeCl_3$ ,  $EtAlCl_2$ ,  
 $Et_{1.5}AlCl_{1.5}$ ,  $Et_2AlCl$ ,  $AlMe_3$  and  $AlEt_3$ .
- 25 9. The catalytic system as claimed in one of the  
preceding claims, characterized in that the  
initiator (I) can be a monofunctional molecule  
(I1), a difunctional molecule (I2), a molecule  
30 substituted by one or more halogen atoms (I3) or a  
Brønsted acid (I4).
10. A process for the cationic polymerization of C3 to  
C10 monomers involving a catalytic system as  
35 claimed in one of the preceding claims.
11. The process as claimed in claim 10, characterized  
in that the monomers are taken from the group  
consisting of dimethylketene, isobutylene, but-1-

- ene, 4-methylpent-1-ene, oct-1-ene, 2-methylbut-1-ene, 3-methylbut-1-ene, 2-methylbut-2-ene, styrene, styrenes substituted by alkyl radicals, such as  $\alpha$ -methylstyrene or p-methylstyrene, 5 halosubstituted styrenes, such as p-chlorostyrene, propylene, isopentene, vinyl monomers in general and vinyl ethers in particular, diolefins or cyclo diolefins with conjugated dienes, such as 1,3-butadiene, 2,3-dimethyl-1,3-butadiene, 10 hexadiene, myrcene, 6,6-dimethylfulvene, piperylene, isoprene, cyclopentadiene, cyclohexadiene or vinylnorbornene, and  $\beta$ -pinene.
12. A polymer capable of being obtained by the process 15 as claimed in either of claims 10 and 11.
13. The use of the catalytic system as claimed in one of claims 1 to 9.